

**1999 Southern Paiute Consortium *Colorado River Corridor* Monitoring
and Education Program
Summary Report**

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DEDICATION

Yetta Jake

This report is dedicated to the memory of Yetta Jake. Yetta participated in the research that documented the cultural significance of the Colorado River and its canyons to the Southern Paiute people. She was instrumental in the development of the monitoring and education program, and she participated every year between 1996 and 1998. One of her main goals was to educate young Paiutes in the traditions of her people. Yetta had many friends, both Indian and non-Indian, and she accepted people of all nationalities. She will always be remembered for her teaching of Paiute language and beliefs about the world, including the animals, plants, rocks, water, elements, and signs of the ancestors. She was a model for all of what it means to "have a good heart."



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1999 Southern Paiute Consortium Colorado River Corridor Monitoring and Education Program Summary Report

INTRODUCTION

This report summarizes the results of the 1999 Southern Paiute Consortium (SPC) Colorado River Corridor Monitoring and Environmental Education program. The basis for the program and the results of its initial development and implementation are fully discussed in the report, *Itus, Auv, Te'ek (Past, Present, Future): Managing Southern Paiute Resources in the Colorado River Corridor* (Stoffle, Austin, Fulfroft, Phillips, and Drye 1995). The results of the work of previous years is described in *1996 Southern Paiute Consortium Colorado River Corridor Monitoring and Education Program: Summary Report* (Austin, Fulfroft, Osife, Drye, and Rogers 1996), *1997 Southern Paiute Consortium Colorado River Corridor Monitoring and Education Program: Summary Report* (Austin, Osife, Drye, Phillips, Gardner and Svinarich 1997), and *1998 Southern Paiute Consortium Colorado River Corridor Monitoring and Education Program: Summary Report* (Austin, Bullets, Drye, Gardner, Kennedy, and Phillips 1998).

The 1999 program had four major goals: (1) modification and implementation of the SPC's monitoring program; (2) training and education of Southern Paiute monitors and their tribal youth; (3) education of Southern Paiute tribal members and the general public; and (4) modification and further development of the archival program and multimedia database. All of these goals were accomplished during 1999. Regular monitoring activities were conducted during a one day trip between Glen Canyon Dam and Lees Ferry, and a ten day trip between Lees Ferry and Diamond Creek.

This report is organized in two chapters. Chapter One summarizes the results of monitoring at each of the SPC monitoring sites visited during 1999. The chapter also provides recommendations for future monitoring and identifies tasks for 2000. Chapter Two summarizes the results of the education and training component of the 1999 program and provides recommendations for the future.

CHAPTER ONE

CULTURAL RESOURCE MONITORING

The 1999 Southern Paiute Consortium (SPC) Colorado River Corridor cultural resource monitoring program operated between January and September. The program included trip preparation, one river trip between Glen Canyon Dam and Lees Ferry, one river trip between Lees Ferry and Diamond Creek; data entry and analysis, and report preparation. The purpose of the program was to continue tribal monitoring as recommended by the Glen Canyon Dam Environmental Impact Statement and Record of Decision. The monitoring program included training and was conducted at the same time as the environmental education program (see Chapter Two). This chapter summarizes the activities of the trip into the Colorado River Corridor and provides recommendations for the 2000 cultural resources monitoring program.

The SPC monitoring program was developed to evaluate the effects of Glen Canyon Dam on cultural resources that have been identified by Southern Paiute consultants within the Colorado River Corridor. Southern Paiutes have worked with the Bureau of Reclamation (BOR) to investigate cultural resource issues since 1992. In 1995, the SPC, on behalf of the Kaibab Band of Paiute Indians and the Paiute Indian Tribe of Utah, began the development and testing of a cultural resource monitoring program. The SPC designed the 1999 monitoring research efforts to advance the existing program.

Methodology

The modifications that were made to the SPC monitoring program in 1996 were continued in 1999 (see Austin, Osife, Fulfroast, Drye, and Rogers 1996 for more details). These include the use of: (1) one composite cultural resource monitoring form; (2) site-specific monitoring checklists; (3) the SPC Monitor Training Program; (4) an SPC plant reference guide; and (5) a monitoring program manager's handbook. In addition, a Southern Paiute River Guide was printed and distributed to river trip participants (see Appendix A).

The 1999 monitoring program included two river trips into the Colorado River Corridor. Prior to those trips, the SPC monitoring team worked together to coordinate monitoring program plans. The first trip into the Corridor occurred June 9 and included three sites between Glen Canyon Dam and Lees Ferry. The monitoring was carried out by the SPC Assistant, one tribal monitor, the SPC consulting ethnobotanist, a UofA research specialist, and three trainees. The second trip included Southern Paiute Consortium monitoring of sites located between Lees Ferry and Diamond Creek; it began on July 5 and ended July 14. The monitoring was carried out by the SPC Coordinator and Assistant, two SPC monitors, two Southern Paiute elders, the SPC consulting ethnobotanist, two UofA research/education specialists, and six trainees.

Sixteen (16) SPC monitoring sites were visited during 1999 (as shown in Table 1.1), and thirteen (13) sites were monitored, as per SPC recommendations. At certain sites, trip participants also took part in Paiute cultural activities. Based upon the observations made during 1998, adjustments were made in the frequency with which sites are monitored. The dates for future monitoring of sites are shown in Table 1.1. Figure 1.1 displays the sites to be monitored in 2000. This map is one product of the SPC GIS database.

Site Discussions

In this section, site by site discussions describe findings at each site that was monitored during the 1999 river trip into the Colorado River Corridor. The summaries of the sites include descriptions of plants, rock art, archaeology and other cultural properties, plus any recommendations for revisions to the monitoring program or for actions to be taken by management agencies regarding the site. For detailed site descriptions, please refer to Stoffle, Austin, Fulfroft, Phillips, and Drye (1995).

Changes made in 1997, regarding the conversion of the segmented belt transects to the line intercept methodology for monitoring plants, were continued in 1999 (see Austin, Osife, Drye, Phillips, Gardner, and Svinarich, 1997). The other change in methodology begun in 1997 - a complete reworking of monitoring at the sites that had originally been established with reliance on Glen Canyon Environmental Studies (GCES) surveyors - was also continued in 1999. Several additional modifications were made during 1999.

During 1997, the SPC monitors and consultants established a six-year plan for monitoring the twenty sites in the SPC monitoring program. As shown in Figure 1.1, the results of the six-year plan were incorporated into the SPC GIS so that annual planning maps can be created.

Table 1.1. Monitoring/Educational Research Study Sites

Date	Site	Activities Completed	Next Mon.
June 9	SPC #1 Glen Canyon	SPC monitoring: Rock Art and Beach Photo Matching	2000
June 9	SPC #2 C:02:037	SPC monitoring : Rock Art and Plant conditions	2001
June 9	SPC #3 Ferry Swale	SPC monitoring : Rock Art and Beach Photo Matching	2000
July 5	SPC #5 South Canyon	SPC monitoring: Rock Art and Beach Conducted cultural transmission	2000
July 6	SPC #6 Nankoweap	SPC monitoring: Archaeology and Plant conditions (Transect #1) Presentation by Elders - Ethnobotany	2000
July 7	SPC #8 Tanner Canyon	SPC monitoring: Rock Art Trail Erosion	2002
July 9	SPC #10 Deer Creek	SPC monitoring: Archaeology, Rock Art, Plant conditions, and Visitors	2000
July 9	SPC#11 Kanab Creek	SPC monitoring: Plant conditions (Transect #1)	2002
July 10	SPC # 12 Vulcan's Anvil	Paiute visit and cultural transmission	2000
July 11	SPC # 13 Whitmore Wash	SPC monitoring: Archaeology, Rock Art and Plant conditions (Transects #1, 2, 3, 4, 5, 6) Presentation by Elders- Arrow Making	2000
July 12	SPC #14 Pre-Parashant Wash	SPC monitoring: Rock Art and Plant conditions (Transect #1) Paiute visit and cultural transmission	2001
July 12	SPC # 15 Ompi Cave	Paiute visit and cultural transmission	2000
July 13	SPC # 16 Spring Canyon	SPC monitoring: Rock Art and Plant conditions Established new photo points	2000
July 13	SPC # 17 Indian Canyon	SPC monitoring: Archaeology and Rock Art Photo Matching	2001
July 13	SPC #18 Pumpkin Spring	TCP monitoring Beach Photo Matching	2000
July 13	SPC # 20 Granite Park	Presentation: Goodding Willow by SPC botanist	2000

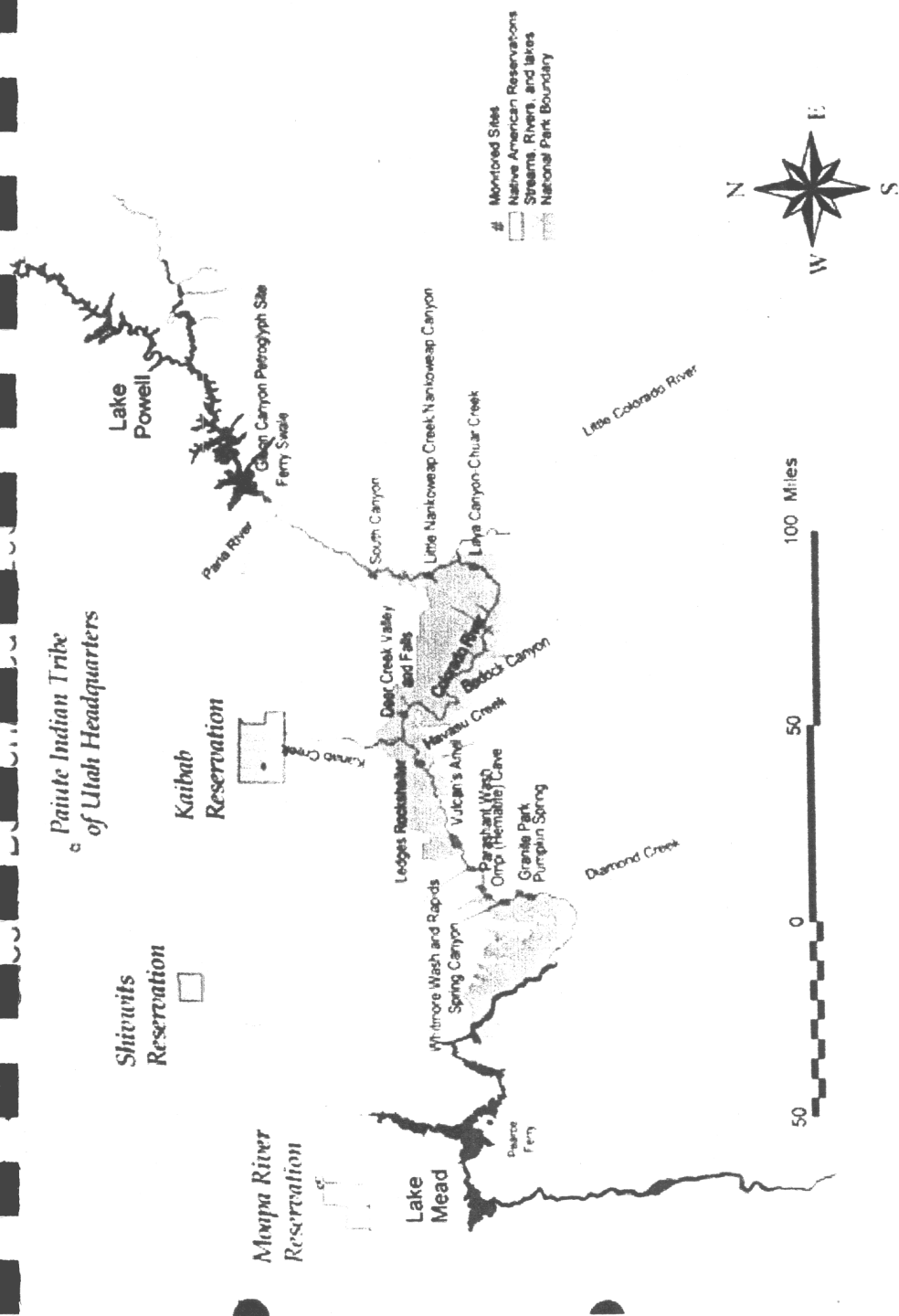
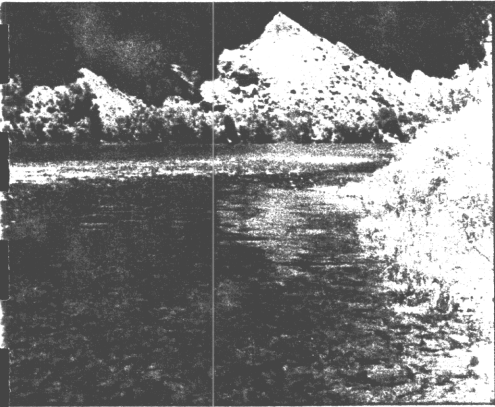


Fig. 1.1 Product of SPC GIS: Sites to be monitored in 2000

Glen Canyon - Monitoring Site #1



At this site, plants and rock art are included in the SPC monitoring program.

Rock Art

This site includes a large rock art panel. Monitoring was completed during the June trip. Photographs were retaken. There were no observed natural impacts to the rock art. There is some possible additional graffiti in one place. Most graffiti had been observed here during previous monitoring.

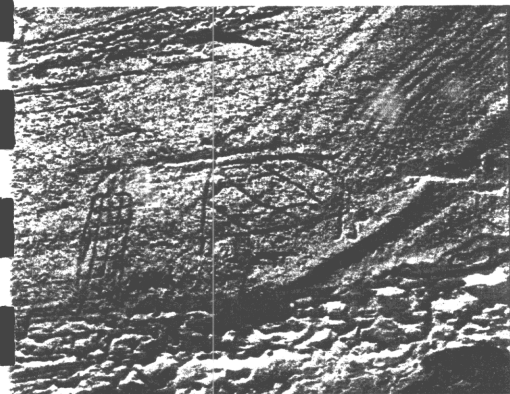
Plants and Beach

The three transects at this site were not run in 1999 because they are monitored on a three year rotation, with the next monitoring being in 2000. Trailing on bench below the site has increased and has affected some plants such as the grass and salt bush. Other human impacts found were some fire rings on the bench and light camping occurring at this site.

Recommendations

The SPC should work with NPS staff of the Glen Canyon National Recreation Area to educate visitors to this area about the cultural significance of rock art panels and the need to protect them. To reduce trailing and erosion along the trail from the beach to the upper bench, steps should be established along the existing trail, and a single trail should be marked along the bench to the rock art site.

02:037- Monitoring Site#2



Rock Art

There is one well established trail to rock art but no extraneous trailing was noted. No graffiti or disturbance to the panel.

Plants

No disturbance to plants was noted.

Recommendations

The SPC recommends that current management policies at this site be maintained.

Ferry Swale- Monitoring Site #3

This site was established to monitor the condition of plants along the Colorado River in the stretch between Glen Canyon Dam and Lees Ferry. The cobble beach at this site discourages visitors and serves as a natural protection for the site. Due to impacts from monitoring, this site has been removed from the regular monitoring schedule. Beach monitoring photos were taken and will be archived as a baseline for the future.

South Canyon - Monitoring Site #5

This site contains archaeology and rock art. All three loci, including archaeology and rock art, as well as the beach and trailing, were monitored in 1999. Although trailing is still a problem on the bench, it has improved some.

Archaeology and Rock Art

Rock art at this site appears to be in good condition, with no new human impacts. Tribal monitors uncovered graffiti next to one of the rock art boulders; according to a river guide, the graffiti was the same symbol that appeared four to five years ago near Stanton's Cave. Collection piles were noted at all three archaeology loci and dispersed by monitors. The only natural impact present was bird droppings on one of the boulders.

Beach

Monitors noted that there is a deposit of 3-4" of additional gravel in South Canyon wash, related to the recent flash flood down the drainage through which the main trail runs. The flood removed one Tamarix and caused it to fall across trail. It also removed 6-15" of sand. A deposit of sand next to the trail is entirely gone.

Recommendations

The log and overgrowth at the lower trail is preventing use by visitors. The SPC considers this a benefit because that trail was rapidly eroding. Visitors appear to be using the upper trail, and that should be encouraged. However, the beach at the landing for the upper trail is smaller, and the beach is steeper, due to erosion caused by the river. Continued maintenance of the trails both to the river and on the bench is recommended.

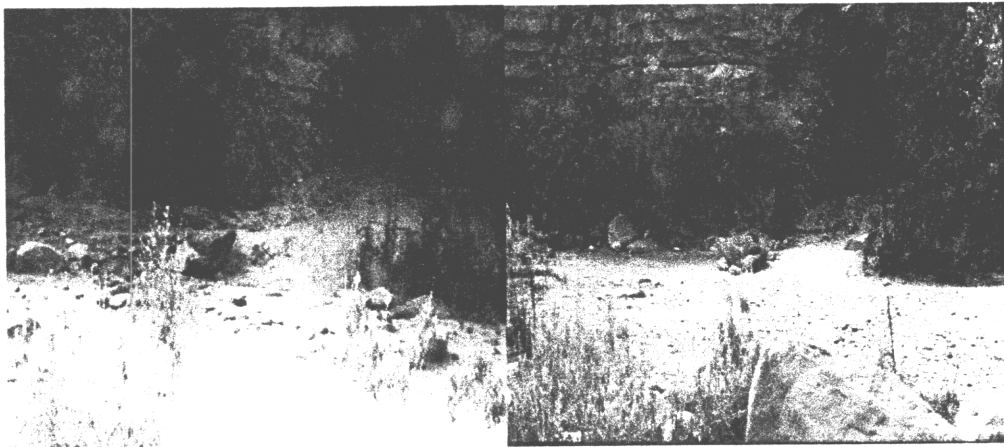


Figure 1.2 New trail along previously flooded channel, 1997 and 1999

Nankoweap - Monitoring Site #6

Archaeological and ethnobotanical monitoring at this site were conducted.

Transect #1 was read during the July visit, and plant conditions were recorded. Overall, the site is in good condition.

Plants

The length of the area not subject to flooding by the river has increased along this transect. During May 1997, when the water was at 21,000 cfs, the area outside the flood zone was 49 m, and during July 1999 (release level unknown), it was 54.5. Since lower releases have been consistent since late 1997, more habitat has been available for plant establishment in the past 18 months; however, this area has not become vegetated. The drop in water level has also left some marsh plants established along the 1997 shoreline without regular water recharge, and some of them are showing the adverse effects of water stress, including scouring rush (*Equisetum laevigatum*) and scratchgrass (*Muhlenbergia asperifolia*).

There has been some erosion of the bank of Nankoweap Creek adjacent to the upper portion of the transect. At normal flow, the channel of the creek is at least 100 feet away from this bank. Plant species diversity is very high on this transect compared to most others because it includes both upland and marsh components, and some mid-elevation plants not normally found along the river are present at the site because seeds that have washed down Nankoweap Creek have become established.

Interpretation of Transect Data

Transect 1 was read during the 1999 river trip; data are presented in Figures 1.3 and 1.4. Transect 1 is a shoreline transect originally established as a belt transect in 1995. It was converted to a line intercept transect for consistency in 1997. Data comparisons are

or 1997-99. The transect runs along the top of the downstream bank of Nankoweap Creek from a point on a high New High Water Zone bench (which has not been flooded since completion of Glen Canyon Dam) to the shoreline of the Colorado River. The upper half of the transect is not subject to flooding, while the lower half is flooded by current release regimes from the dam. The lower portion was scoured by the experimental flood in 1996, and recovery of riparian and marsh plants has occurred since that time. Most of the changes in vegetation since 1996 reflect changes in plants along the fluctuating shoreline; conditions in the upper portion have been stable, except for the loss of a few plants apparently due to drought conditions.

The trend along Transect 1 is for a steady increase in plant cover since May, 1997. High releases in 1997 did not adversely affect plant cover in the affected area; in fact, it increased between May and September (Austin et al. 1997). The transect was not read in 1998, so two years of change in plant cover is represented by the 1999 reading. The increase in 1999 is due to two factors: lower releases since 1997 have exposed more area along the shore, which has been invaded primarily by marsh species, and the area which was flooded and scoured in 1996 has seen a steady increase in plant cover.

Archaeology

Overall, the archaeological sites, both on the bench and the ridge, were in good condition during the July visit. Monitors noted that the trailing has increased on the upper bench. Visible tracks found inside of rock houses more than previous monitoring photos. The grinding stone has been moved. It was also noted that the "extra" trails on the lower bench appear to be experiencing low use.

Recommendations

As at other sites, the visitor impacts at Nankoweap can best be reduced through education of visitors on their river trips. For example, visitors should be instructed not to move artifacts, go inside rock shelters, or otherwise disturb sites. Each element at a site is connected to the other elements there and to the past, present, and future life at a site. Every effort should be made to minimize disruption of these sites.

Decreased average releases from the dam in the past 18 months have opened up habitat along the shoreline which is gradually being invaded by plants. The transects will continue to monitor these trends and should be run according to the schedule established in 1997. A high level release, such as that of 1996, every five to ten years, is beneficial to riparian zone vegetation.

Percent Cover by Species - Nankoweap

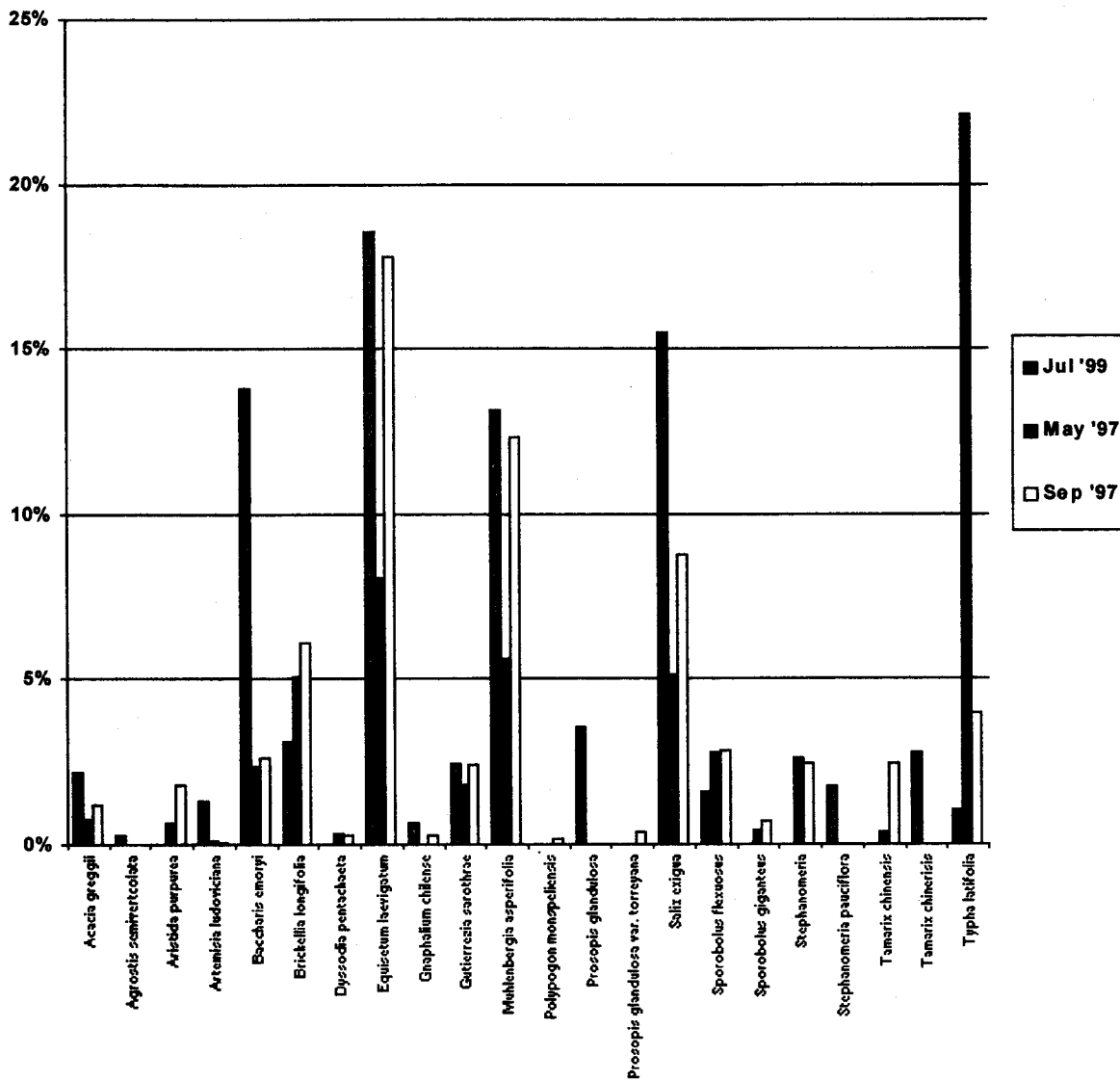


Figure 1.3. Changes in plant species

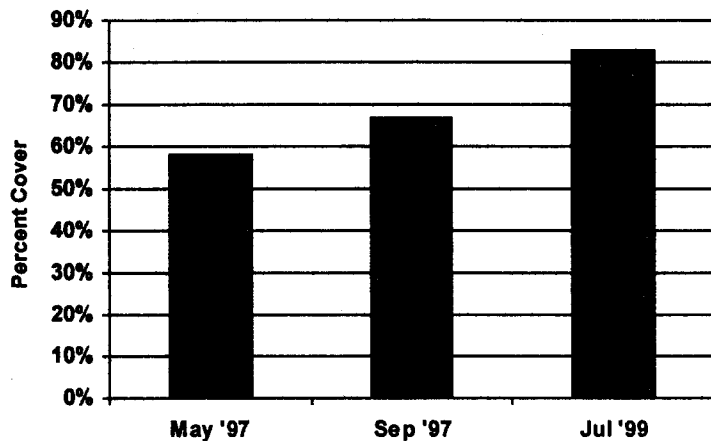


Figure 1.4. Change in overall productivity between May 1997 and July 1999

Tanner Canyon- Monitoring Site #8

Rock Art

Monitors noted that there were some recent human and natural impacts at this site. The site showed little sign of visitation, although the trailing alongside the rock art boulders continues to be a problem. The rock art boulders were assessed to be in good condition by the monitors. No visible graffiti was found on the rock art. The 1998 flood occurred through Tanner wash and moved rocks within it.

Beach

The beach at this site was heavily impacted by the 1996 and 1997 high water releases and has not fully recovered. Other than that significant impact, no new human impacts were found. Although there are main trails to use on this site, people seem to be wandering off trails.

Recommendations

The trail must be rerouted up the wash and away from the rock art boulders to prevent further destabilization at this site. The area with the existing trail should be stabilized after it is abandoned to prevent further erosion. The SPC monitors should be included in trail work at this site.

Deer Creek - Monitoring Site #10

Plant, rock art and visitor monitoring were conducted at this site in 1999. SPC monitors were present at the site from early morning to early afternoon. Visitors were monitored in a two-hour visitor monitoring session, from three different points along the canyon. No river trips arrived at the site during the monitoring visit, and tribal members appreciated the stillness and calm there.

Rock Art

Rock art at this site appears to be in good condition, but two moss rubbings and two scratches were noted as vandalism to the rock panels along the trail.

Plants

The condition of plants in the plot is generally very good, and the agave (*Agave* sp.) and trees have all continued to grow as they recover from the fire. The trees that fell across the trail in late 1997 are still present, but the trail has been re-established by hikers away from the plot. Photo points for the monitoring photos of the cottonwoods had to be moved farther back because the trees have grown so large they can no longer be shown from the original points. The agave continues to produce new offsets, and the largest shows no sign of flowering this year.

The locoweed (*Astragalus praelongus*) that has been monitored as Plant 7 has died, perhaps due to drought stress during the past year. There was no sign of human disturbance to the site. As before, monitors "brushed" the site upon leaving to prevent any temptation on the part of hikers to camp there.

Interpretation of Plant Plot Data

The Deer Creek plant plot was read during the 1999 river trip; results are presented in Figure 1.5. The plot was established in 1995 in an area that was burned in 1994; eight selected plants in the plot have been measured once or twice per year since then to monitor recovery following the fire. Height, width, and number of stems are measured for each plant; only height is plotted on the graphs shown in Figure 1.5.

In all cases, plants that were selected were alive before the fire, and all except the agave were burned to the ground. They subsequently sprouted from the roots, which survived. The outer leaves of the succulent agave were damaged, but the larger offsets survived. The largest rosette flowered in 1995, the first time in at least 20 years that it had become reproductive. The plant is believed to be an undescribed species, and only two individuals are known, at Deer Creek and at another site a few miles away in Grand Canyon. Its origin is unknown, but it is possible that it is of cultural hybrid origin, brought to or bred at the site by Native Americans who were living and farming in Deer Creek valley. Scientific description is in process (W. Hodgson, personal communication). Agave

rosettes die after flowering, and the rosette for which measurements are taken is the largest sterile rosette. The root system produces numerous offset rosettes, which numbered 21 in an area approximately 2 m in diameter in 1999.

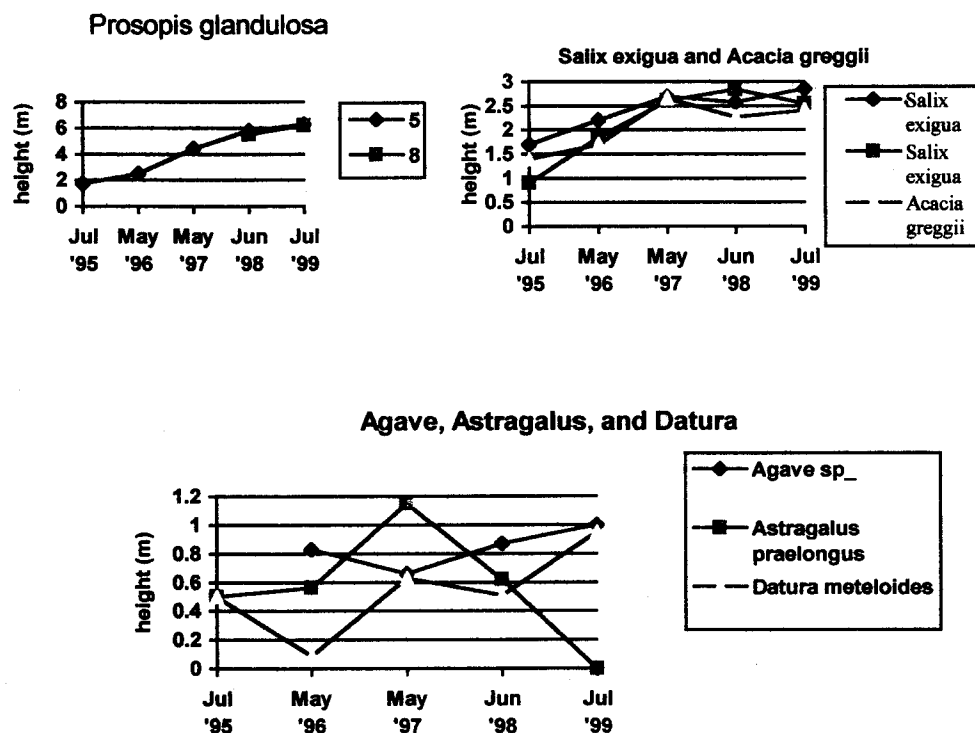


Figure 1.5. Growth of plants in Deer Creek plot

The cottonwoods (*Populus fremontii*) have grown over 6 m since the fire, and they continue to increase in height by more than 1 m per year. Coyote willow (*Salix exigua*) and catclaw acacia (*Acacia greggii*) grew rapidly for the first three years, when they reached the usual maximum height for the species. They have since added new stems each year.

The two herbaceous plants measured, sacred datura (*Datura meteloides*) and locoweed (*Astragalus praelongus*) recovered from the fire during the first year, and their variation since then is probably related to environmental factors such as drought and freezing temperatures. The locoweed was dead in 1999, or at least there were no aboveground living stems. This may have been due to severe drought conditions during the winter of 1998-99, although the sacred datura, which is somewhat more of a xerophyte, was larger in 1999 than it was in 1998.

Recommendations

It is recommended that Deer Creek continue to be monitored every year (according to the SPC monitoring schedule) to re-read the individual plant plot and observe the conditions of the rock art panels. Two tribal monitors visited one of the archaeology sites within Deer Creek canyon and noted that trailing has begun to be a problem there. This site should be reviewed in 2000 as a possible addition to the SPC monitoring program.

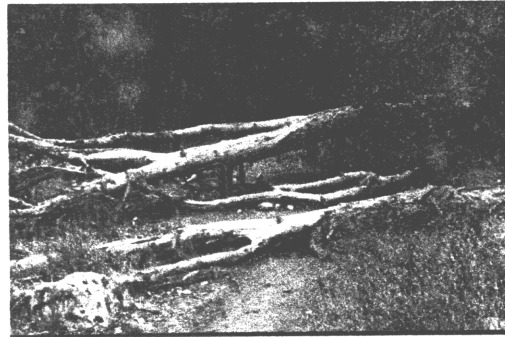


Figure 1.6. Logs in trail at Deer Creek

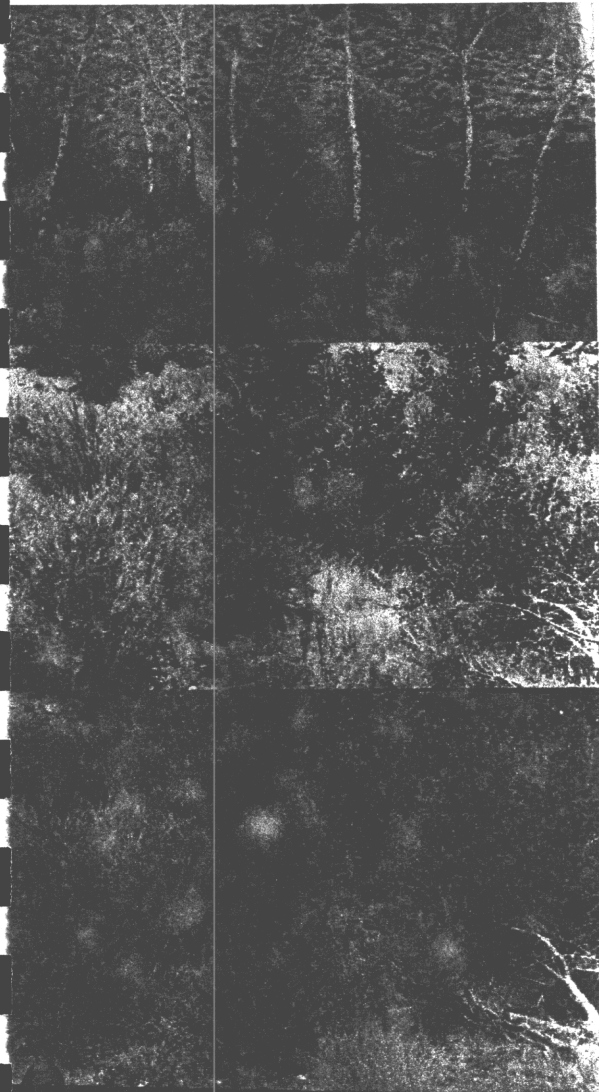
Trail work is needed to remove the cottonwood trees that were blown down during a storm in September of 1997. These trees lie across the trail next to the plant plot and the rare *Agave* plant within it. Because the trees have not been removed from the trail, visitors are beginning to establish a new trail around and over the fallen trees and coming very close to the *Agave*. A chain saw should be used to cut pieces out of the trees to allow trail access. The cut sections should be discarded to the right (facing upstream), and the remains of the cottonwood tree should be left in place, as they discourage access to the plot. Removing them could damage some monitored plants.

Kanab Creek- Monitoring Site #11

Plants and the beach are monitored at this site.

Beach

Monitoring of the beach at Kanab Creek allows the SPC to observe the combined impacts of side canyon and main river activity. During the 1999 monitoring activities, Kanab Creek experienced a flash flood. Kanab Creek can only be monitored when the water levels are below 15,000 cfs because the river backs up into the channel. In 1999, monitors noted a rock slide that occurred a few hundred meters up the mouth of Kanab Creek.



Plant plot density in 1996

Plant plot density in 1998

Plant plot density in 1999

Figure 1.7 Improved plant density in Deer Creek plant plot

Plants

This site had not been visited since 1996, and was established in part as a control site away from the influence of the Colorado River. Consequently, few changes were noted except for deepening of the trail that runs across the bench and is well used by visitors. As described below, major changes were made in the length of the transect to better sample the entire study area.

The upper half of the transect, along the line of the original belt transect, contains mostly desert plant species which were generally unchanged from the last reading. There was some evidence of new erosion along the small drainages that cross the transect, and for which there are monitoring photographs. A large barrel cactus in one of these photos had tipped over, probably due to its being top heavy and falling when the soil was saturated after abundant rainfall. The lower (new) portion of the transect goes through a

dense thicket of Engelmann prickly pear cactus (*Opuntia phaeacantha*), which is dense enough that it discourages hikers from leaving the trail and protects the bench and its archeological resources from multiple trailing and other visitor impacts.

Interpretation of Transect Data

Transect 1 was read during the 1999 river trip; data are presented in Figure 1.8. This plant transect is located on a bench along Kanab Creek about 250 m upstream from the Colorado River. The lower part of the bench contains sand deposits of the Old High Water Zone from pre-dam floods. This bench has buried archeological material which is being exposed by trailing. Away from the creek the bench transitions to a steep talus slope consisting of fine shales. The upper edge of the slope is at a rock shelter which also contains evidence of occupation or use. In 1995 a belt transect was established from a large boulder at the bench-talus slope transition up the slope to the rock shelter. This transect was re-read in 1996, but not in 1997 or 1998 because the site was subject to damage by trampling, and it was difficult to access when Colorado River levels were high.

In 1999, the monitoring extended the transect to the lower edge of the bench, approximately doubling its length. Point A (0) was changed from the boulder to the rock shelter, to be consistent with other sites. The new Point B is at the outer edge of the bench, at the top of an unstable vertical slope about 5 m high whose base is at the floor of Kanab Creek. The new transect was read as a line intercept transect. Although the original alignment from the shelter to the boulder was retained, the data from previous readings is not directly comparable. Monitoring photos from this portion of the transect are comparable to those taken in 1995 and 1996.

Extending the transect accomplishes several monitoring objectives. The Kanab Creek hiking trail, which crosses the bench, is gradually deepening due to channelization of runoff during heavy rains, and is exposing a hearth and other archeological materials. The transect crosses the trail. The outer edge of the bench is very unstable, and is subject to erosion during major floods in Kanab Creek. This may also be affected by the highest releases from Glen Canyon Dam, so there is now a potential connection of the site to dam operations.

Recommendations

The monitoring schedule should be changed from one transect per year to all three transects every three years to reduce erosion on the site and impacts along the beach at the boat docking site.

Percent Cover by Species - Kanab Creek

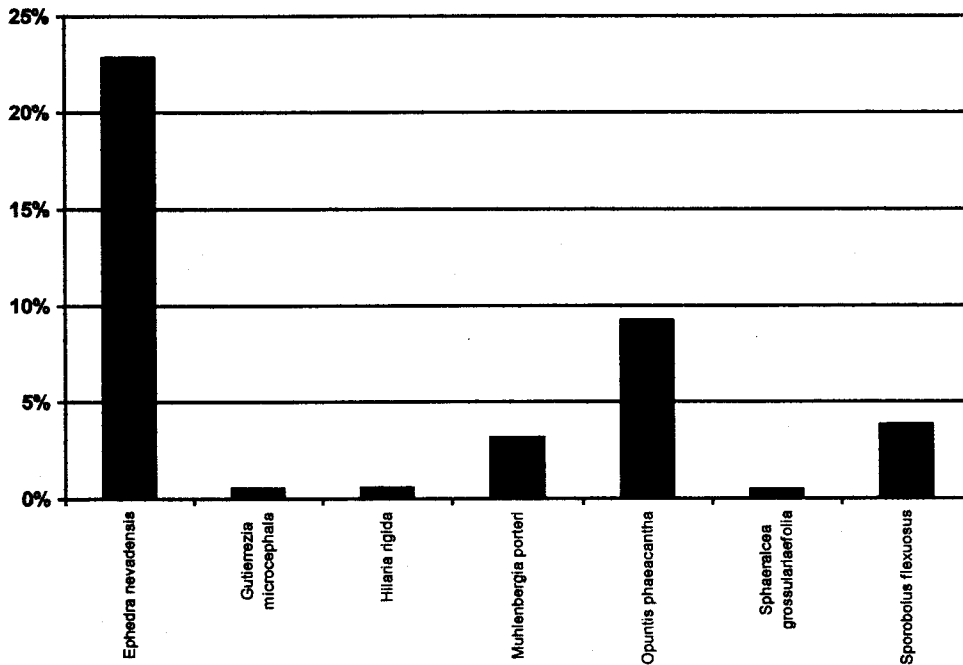


Figure 1.8. Percent cover by species at Kanab Creek, July 1999

Vulcan's Anvil- Monitoring Site #12

Plants

This site, which was last visited in May 1996, showed few changes during the past three years. There are three transects here, and the only one read in 1999 was the original one, designated Transect 1. This transect is subject to damage from trampling and erosion if care is not taken in setting the line and reading, due to unstable, steep slopes through which it passes near Point A.

There is not a good docking site or camping beach at this site, and it is infrequently visited by river trips. The shoreline is protected by dense scouring rush (*Equisetum laevigatum*) along the river's edge, discouraging river trips from stopping.

Percent Cover by Species - Vulcan's Anvil

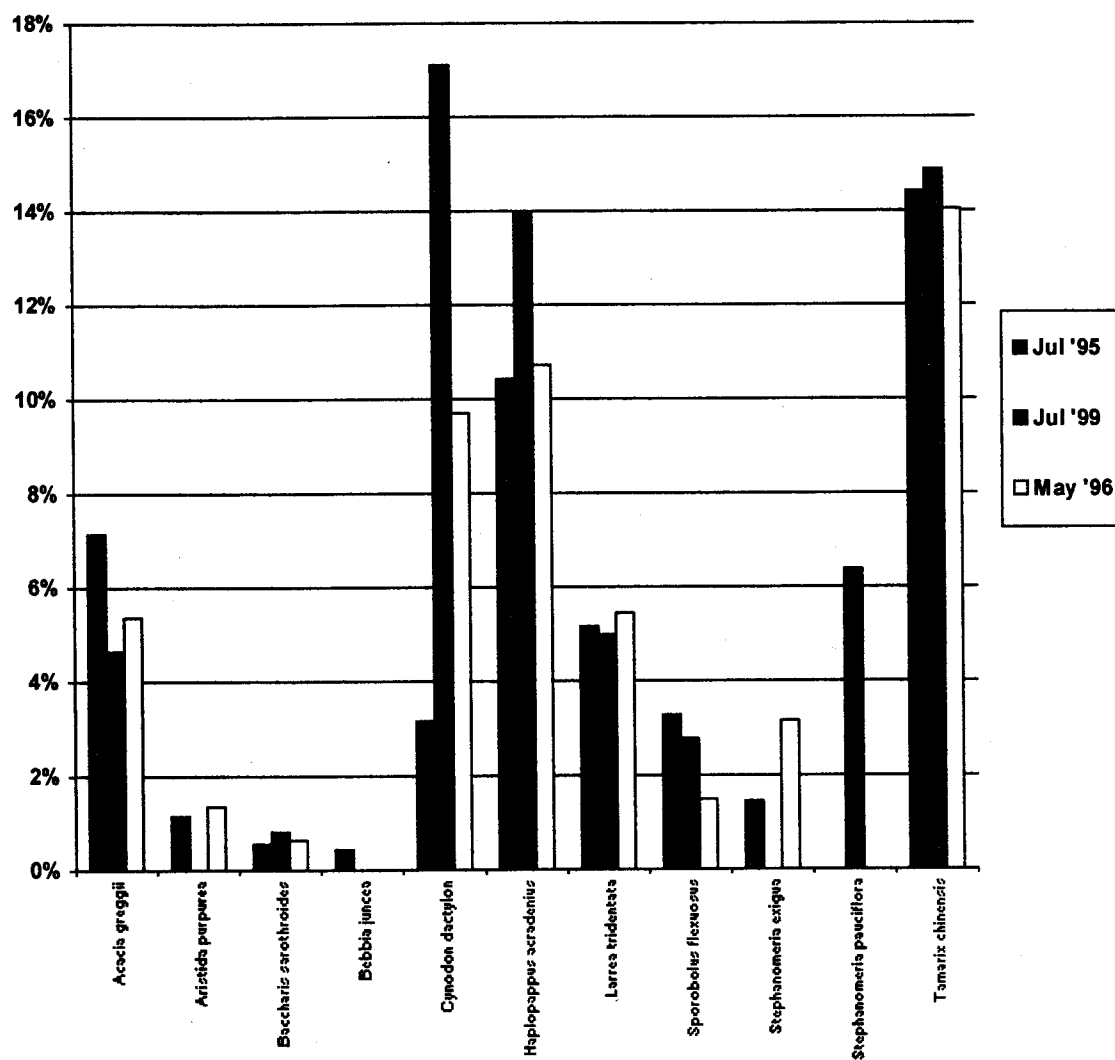


Figure 1.9. Percent cover by species at Vulcans Anvil, July, 1999

Interpretation of Transect Data

Transect 1, the original transect on the beach next to the Anvil, was installed in 1995 and last read in May 1996. It was subject to deposition of sand during the experimental flood of April 1996 in its lower reaches. It was read during the 1999 river trip; data are presented in Figures 1.9 and 1.10.

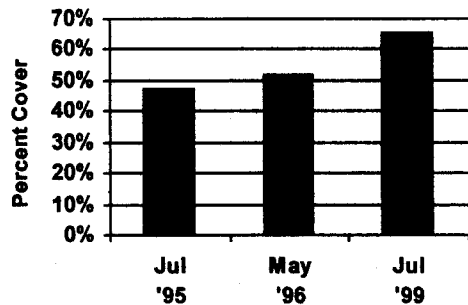


Figure 1.10. Change in overall productivity between July 1995 and July 1999

Two important changes were noted in 1999. The first was a large increase in Bermuda grass (*Cynodon dactylon*) on the portion where sand was deposited during the flood. This is consistent with what has occurred throughout the lower canyon: Bermuda grass had increased markedly since the 1996 high release, in some places holding in place sediment that might otherwise have been eroded by subsequent fluctuating flows. However, as an exotic species, an increase in Bermuda grass may not be viewed as completely positive. The second change was a loss of several plants of catclaw acacia (*Acacia greggii*), mesa dropseed (*Sporobolus flexuosus*), and *Haplopappus acradenius*. The cause of death or decrease in size of these plants was not immediately obvious; it was not due to human causes or high water, and may have been due to drought conditions.

Whitmore Wash - Monitoring Site #13

Plants and rock art were monitored at this site in 1999. The new method of installing transects that was initiated in 1998 was repeated in 1999 due to the lack of reasonably permanent endpoints. Six random numbers were selected representing distances along the 75m baseline. At each point, a 50m transect perpendicular to the baseline was run towards the river, at an angle of 114 degrees. These were read as line intercept transects (see Figures 1.11 and 1.12). Also recorded were trails (if present), the upper edge of the steep bank, the lower edge of the bank (tape held vertically), and the edge of the water - including the sandbar.

Plants

Whitmore has proved to be a difficult site for repetitive plant analyses. The large, densely vegetated beach does not lend itself to establishment of transects with fixed endpoints, and attempts to locate transects using survey points established by GCMRC surveyors proved to be unreliable.

Although some erosion has occurred at the base of the bank, no large sections of bank have been lost in the past year. The sandbar noted in 1998 is still present, although it is low enough that it would be flooded at moderate to high release levels.

In certain portions of the beach, young mesquites are vigorously growing and crowding out arrowweed (*Tessaria sericea*). These are below the Old High Water Zone, and probably germinated after the flood of 1983.

There are several trails along the front part of the beach; most are more or less overgrown and only occasionally used. Heavy trailing is present only around the docking area and leading up to the rock art panel.

Interpretation of Transect Data

At the 1998 visit, the monitoring team modified the methodology in an attempt to overcome previous problems. A baseline 75 m long and more or less parallel to the shore was established on the mid portion of the beach, with fixed end points on large saltcedar and mesquite trees. A measuring tape was run between these points. Random numbers were selected, representing points along this tape. A fifty meter transect was established from each of these points, running perpendicular to the baseline toward the river. Six of these transects were run as line intercept transects in 1998 and 1999. Each was 50 meters long, and the end continued past the shoreline and into the river. The position of the unstable bank and its height were measured. The data from these six transects were combined for analysis. The number of transects was limited to six due to time constraints.

The baseline was located and reset in 1999, and a series of six new randomly selected transects was read. This should allow us to monitor changes in the position of the bank, new trailing (which was also recorded), and formation of new offshore sand bars, as well as changes in the vegetation on the beach.

Data from the six transects read in June 1999 are shown in Figures 1.11 and 1.12. These document a beach dominated by arrowweed, with scattered large mesquites away from the shore and fairly dense scouring rush near the river. The graph shows close correlation between the two readings in both species diversity and cover values for each species, indicating that the vegetation at the site is fairly uniform, not rapidly changing, and that six randomly selected transects may be a sufficient number to adequately sample the site. The data plotted include only the vegetated area from the baseline to the top of the bank; plants beyond that point, which were generally only scouring rush on the steep bank itself, were not included.

Beach

Monitors noted that some additional erosion of the bank has occurred at this site, and it is still unstable and steep. The height of the bank was measured at the end of each transect.

Monitors at this site noted that some trail erosion has occurred, and that the trail appears to be moving closer to the paint source. The rock art at this site has not received any new impacts since the last monitoring.

Percent Cover by Species - Whitmore

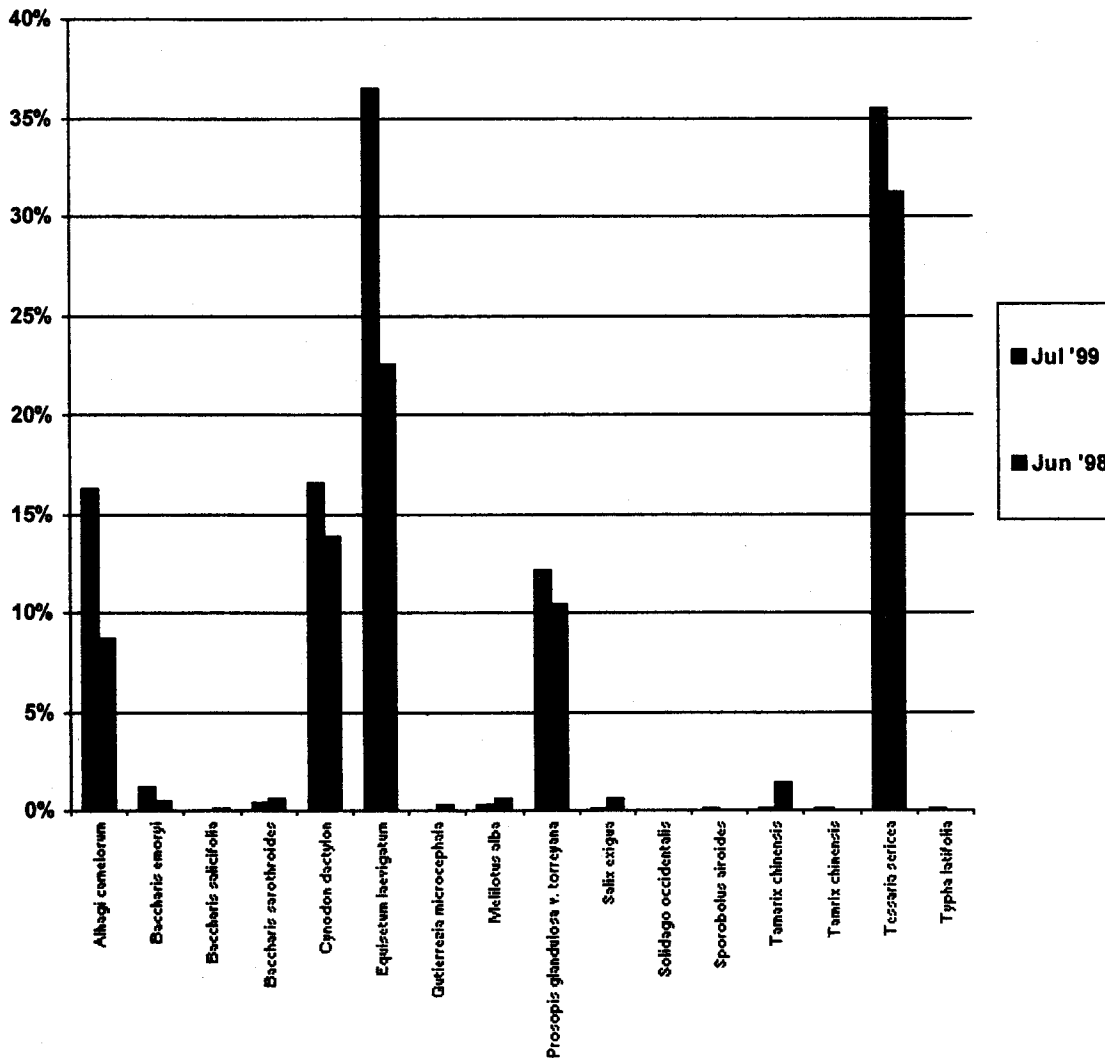


Figure 1.11 Percent cover by species at Whitmore, July, 1999

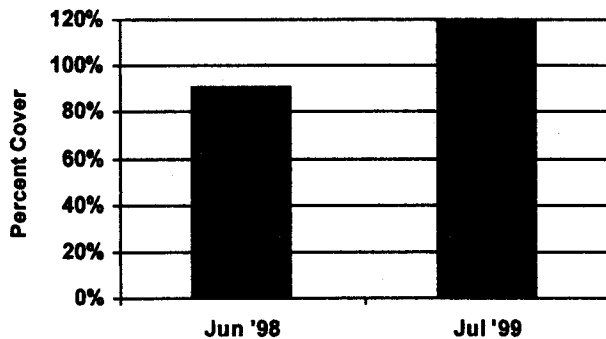


Figure 1.12 Change in overall productivity at Whitmore between 1998 and 1999

Recommendations

The monitoring regime set in 1998, which includes six random transects off an established baseline, should be continued at three year intervals beginning next in 2002. Trailing throughout this site has increased tremendously, apparently due to difficulty of boat access resulting from the large bank created by the fluctuating river levels following the 1996 deposition from the high water release. Less diurnal fluctuation would likely reduce this problem.

Above Parashant Wash- Monitoring Site #14

Plants

Monitors noted that this site was in very good condition and had apparently received no recent visitation. A dense dry marsh of scouring rush had grown along the shoreline at the boat docking point since the last visit, and this was impacted by people getting off and on the boats. A trail was created through this dense vegetation, and might tempt other river trips to stop here until it recovers.

The monitoring team discussed visiting this site only every third year and running all three transects at once in order to minimize damage to vegetation at the docking site.

Interpretation of Transect Data

Transect 1 above Parashant was read during the 1999 river trip; data are presented in Figures 1.13 and 1.14. The last reading of this transect was in September 1997. Two additional transects were established at that time. These were not read In 1999.

The total plant productivity was down at this reading, although the general impression was that the plant community appeared to be healthy. There was some dieback of brittlebush (*Encelia farinosa*) and catclaw acacia in the upper part of the transect, and of some of the grasses and small shrubs in the area above the 1996 flood deposition. This may have been due to drought stress since the last reading. The condition of plants near the shore was excellent, and the riparian/marsh zone had increased, especially in the amount of scouring rush.

The dominant plant on the line continued to be Torrey mesquite (*Prosopis glandulosa* var. *torreyana*), which has more than doubled its per cent cover since September 1997. This reflects considerable growth of the young, vigorous trees in the central part of the transect. Saltcedar (*Tamarix chinensis*) was somewhat lower than its last reading; this was probably an artifact of how branches from trees off the line happened to overhang the transect at the two readings. It was not apparent that saltcedar in this part of the canyon was unhealthy or decreasing.

Rock Art

A red boulder with black figures at this site is breaking apart slowly. There is no other increase in impacts from previous years.

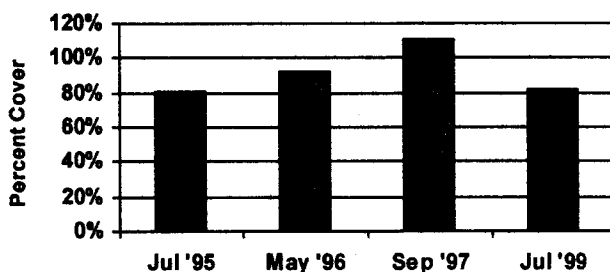


Figure 1.13 Change in overall productivity between July 1995 and July 1999

Percent Cover by Species - PreParashant

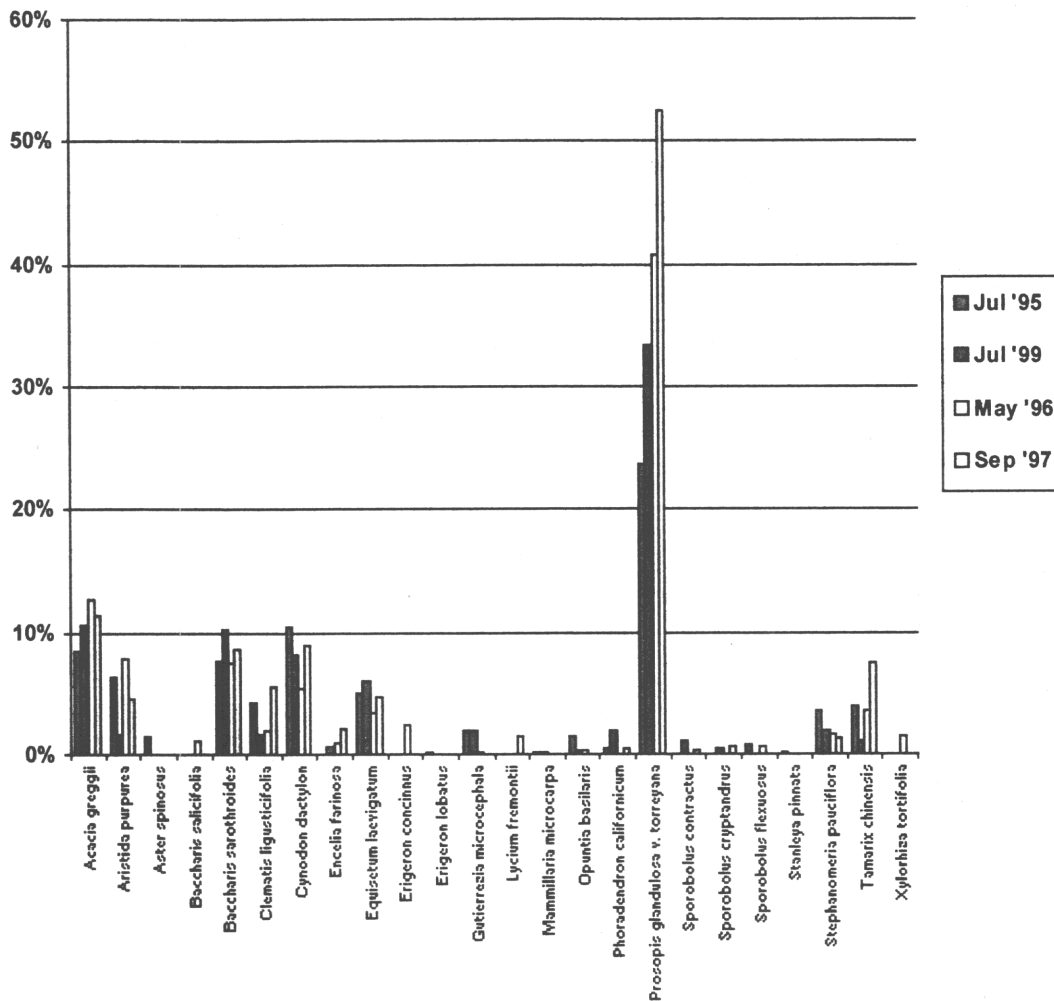


Figure 1.14 Percent cover by species above Parashant

Recommendations

The monitoring schedule should be changed from one transect per year to all three transects every three years to reduce erosion on the site and impacts along the beach at the boat docking site. This change should begin in 2001.

Ompi Cave - Monitoring Site #15

This site was visited for spiritual and ceremonial reasons, but monitoring involved only visual inspection.

Spring Canyon - Monitoring Site #16

Monitoring of rock art and plants was completed at this site in 1999. A recent flood scoured the channel, but the monitors observed no impacts to the archaeology and rock art.

Plants

A major flash flood has scoured Spring Canyon since the last SPC visit. All parts of the study area were affected, and most plants which had been recovering after the 1995 flash flood were washed out. This flood scoured the canyon floor deeper and the severe effects reached farther upstream than the 1995 flood.

Developing a repeatable method for monitoring this site has been an ongoing problem due to the dynamic nature of Spring Canyon. The monitoring team decided not to install new transects this year, and to utilize matched photos for future interpretation. The details and rationale of this new method are described below.

Interpretation of Plant Data

The planned task for 1999 was to install three new transects across the canyon in the middle portion of the study area (the first of the new series of transects was installed in the upper part in 1998). However, when the monitoring team assessed the effects of the recent flood, it became apparent that establishing endpoints on the banks was impractical, since the shore as well as the floor had been changed by the flood. The monitoring team decided to again change the methodology, and decided not to install additional transects. Instead, a series of six photo points was established along the floor of the canyon, with photos taken looking upstream and downstream at each point. The points were located so as to cover all of the study area from the river to the outcrop with the rock shelter. Since the canyon floor changes so frequently due to flooding, making rocks on the floor unreliable for matching photos, features on the canyon walls were utilized.

Each photo can be matched using standard photo matching techniques matching cliffs or outcrops in the midground above from the canyon floor with features in the background. Using these photos, it should be possible to qualitatively assess the recovery of vegetation along the canyon floor in succeeding years, locating the photo points by matching features that will not be affected by any future floods.

Archaeology and Rock Art

The rock shelter at this site was not entered in 1999, due to heavy vegetation surrounding it. This vegetation continues to protect the site. Monitors noted that the trail to the rock art panels is in the same condition as past years.

Recommendations

It is recommended that the three transects established in 1998 be re-run in 2000. The photos established in 1999 should be matched and retaken every year.

Indian Canyon - Monitoring Site #17

Rock art and archaeology were monitored at this site in 1999. Particular attention was paid to the area in and around the roasting pit, which has had problems with trailing in previous years.

Archaeology and Rock Art

Retrailing by the NPS at this site has been successful, and the monitoring team was pleased to note the improvement and that there was no further evidence of new trailing through the roasting pit.

Recommendations

The condition at this site has improved since 1997 when problems with trailing were noted. Monitoring should continue as per the SPC five year plan.

Pumpkin Spring - Monitoring Site #18

This spring and surrounding vegetation were monitored in 1999; according to the SPC monitors, bubbling within the spring was increased and the water within the spring was clearer this year. In addition, arroyo cutting at this site has increased (see Figure 1.15). These impacts are exacerbated by the fluctuating water levels since sand was deposited during the 1996 high water release.

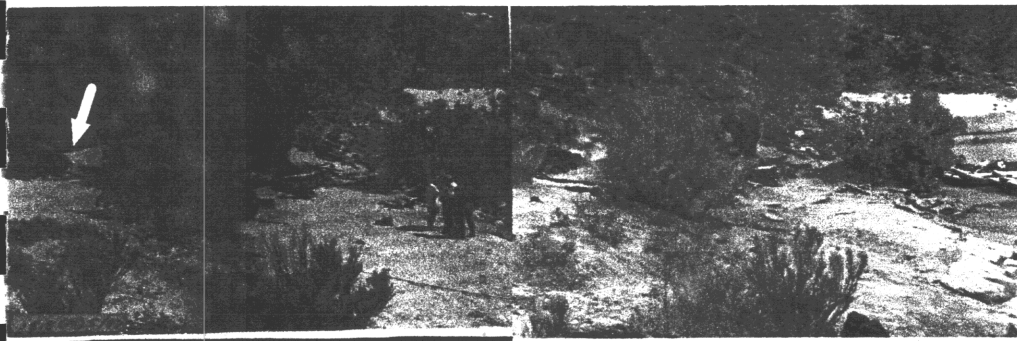


Figure 1.15. Increased arroyo cutting at Pumpkin Spring 1997 to 1999

Granite Park- Monitoring Site #20

The Goodding willow at this site was visited in 1999. It continues to grow but remains threatened by the erosion at the base of the tree.

Recommendations

The SPC will continue to monitor the effects of beach erosion on the Goodding willow at this site and will seek sources of funding for protecting this historic tree.

Summary and Conclusions

The SPC monitoring program continues to provide useful and appropriate data. The continued use of the modified SPC monitoring forms and the customized Access database simplified and made more efficient the data collection, storage, and analysis required in this program.

Check lists and monitoring forms should continue to be prepared by the SPC monitoring team at least one month prior to any monitoring trip, as outlined in the program manager's guidebook. The Tribal Monitor Training Program, plant reference guide, and Paiute River Guide facilitated the orientation of tribal youth to the SPC monitoring program (see Chapter Two).

The primary challenge facing the 2000 SPC monitoring program is to follow the changes in water releases resulting from operations of the Glen Canyon Dam and to adjust the monitoring program and schedule as needed to assess the effects of such changes. The development of the SPC GIS database, which includes the monitoring schedule and the activities to be monitored at each site during each monitoring period, can assist in rapid planning. This database also includes information about sites likely to be impacted by various water levels to facilitate planning in response to new developments. Additional goals for 2000 include (1) further integration of the program with work being done by other agencies, especially other tribes, the BOR, and NPS; (2) increased public education and outreach, including communication with river guides and others who have contact with tourists who have the potential to impact sites; and (3) incorporation of previously archived data into the current program. The SPC program serves the special needs of the governments of the Kaibab Paiute Tribe and Paiute Indian Tribe of Utah (PITU) and the resource management agencies of the United States.

APTER TWO

UCATION AND TRAINING



The 1999 Southern Paiute Consortium *Colorado River Corridor* Education and Training Program was specifically designed to provide education about the annual research, monitoring, and education program to tribal members and youth from two tribes of the Southern Paiute Consortium: the Kaibab Band of Paiute Indians and the Paiute Indian Tribe of Utah (PITU). This aspect of the program is necessary to inform and educate future tribal leaders and train tribal monitors (See Austin, Fulfrost, Osife,

e, and Rogers 1996). The educational component of the program continues to be supported in the University of Arizona (UofA) and is expected to remain an important element of the all program. During 1999, this aspect of the program also was supported by a grant from G Apex, Inc., located on the Shivwits Paiute Reservation.

gram Activity Discussions

etings and River Trip Preparation

mary of Activities

Each year the SPC prepares information pertaining to the annual monitoring river trip for presentation to the Consortium members. During 1999, the Consortium staff made at least one presentation to each of the nine tribal councils (PITU has a general council and each of the five has its own council). The tribes were provided with information pertaining to the trip, work would be accomplished on the trip, and the availability of space for tribal members to present from each of the bands. When requested, the Consortium staff provided additional information to the tribes.

By May, a list of proposed tribal youth representatives was submitted to the Consortium for the participating tribes. The youth were asked to submit a statement explaining why they wanted to participate in the trip and a letter of support from an elder or relative. A monitoring workshop was held on the Kaibab Paiute Reservation from May 22-23. The monitoring program that was developed in 1997 (see Austin, Osife, Drye, Phillips, Gardner, and Garich 1997) was modified for cultural resource monitoring sites on the Kaibab reservation. Workshop participants included the SPC Coordinator and Assistant, two tribal monitors, a tribal representative, the SPC consulting ethnobotanist and Kaibab's archaeologist, the former SPC Coordinator, UofA educational/research specialists, and five youth who would be participating in the 1999 river trip. The Kaibab Paiute tourism office prepared meals for the event.

During the training workshop, tribal youth were introduced to the SPC monitoring program and the history of Southern Paiute participation in the Glen Canyon Dam Environmental Impact Statement and Adaptive Management Program. The first Coordinator of the Southern Paiute Consortium joined the trip participants for the evening circle to share information about the program beginnings, including the development of the Programmatic Agreement for Cultural Resources in the Colorado River Corridor. During the workshop, the youth also learned about the importance of the Colorado River to Southern Paiutes and appropriate behavior within its riparian zones. Workshop presenters also discussed the ongoing relationship between the Southern Paiute tribes and federal agencies such as the Bureau of Reclamation (BOR) and National Park Service regarding the Colorado River Corridor. They shared information about ethnobotany and geology. The workshop participants camped on the Kaibab reservation and received information that included the dates of the river trip, the sites that were to be monitored and the type of monitoring that would be conducted, and the expectations the SPC had for trip participants. The SPC also presented a "tour" of the SPC multimedia database and archive.



Finally, trip participants were given basic information about what personal belongings they needed to pack to be prepared for their trip and when they could have access to the multimedia database to see specific site information. Each youth participant received a copy of the Public Multimedia Module to review prior to the river trip. The youth also were urged to visit with tribal elders before the trip to help prepare themselves for the experience.

Recommendations

River trip preparation is a key component of the education and training program. Going into the Colorado River Corridor, Southern Paiutes are entering a place rich with spiritual and cultural meaning. Although there is no way to fully prepare for the transformational experiences that occur (see **The Downriver Trip** below), through stories and discussions trip participants can gain the information they need to make themselves ready for the trip and get the most out of the experience. The pre-trip camp out and workshops were an important addition to the preparation and should continue in the future, possibly alternating between the Kaibab and Shivwits reservations. In the future, it is recommended that the pre-trip meetings continue to extend over several months and include the distribution of the Public Multimedia Module and access to the multimedia database and archive. Also, because many of the activities that take place on the river occur in the Southern Paiute language, there is a need to link Paiute language programs to the educational component of the program.

Appendix Reference Guide

Southern Paiutes have a special relationship to plants, and the monitoring program reflects the stewardship role of the Paiute people. To assist tribal monitors and other trip participants in carrying out the monitoring activities and to facilitate learning about the plants that are culturally

significant to Southern Paiutes, a plant reference guide was developed in 1997. The guide includes 300 pages of plants with photos; Paiute, scientific, and common plant names; and information about the significance of the plants in Southern Paiute culture. It was created using presentation software so each page can be accessed individually for editing and updating. During 1999, the guide was updated and modified based on recommendations from the trip during 1998. With special funding from the Grand Canyon Research and Monitoring Center, the SPC was able to print copies of the plant reference guide and distribute them to monitors and the tribal offices. Additional copies will be printed and distributed in the fall of 1999.

Southern Paiute River Guide

Based on recommendations from 1997, the SPC began development of a *Southern Paiute River Guide* for use by monitors and trip participants. The guide includes overview maps of Southern Paiute territory and has a location finder on each page that shows the reader where s/he is along the river and within the larger territory. This feature was included because of the difficulty of locating one's location along the river with the traditional territory and known places on the river. The guide also has space for notetaking so participants can record information they want to remember about places and events that occur along the river. The guide was used during the 1999 downriver trip; participants corrected errors and suggested revisions and additions.

Upriver Trip

Summary of Activities

The upriver trip took place on June 9, and educational activities occurred in conjunction with the Upriver Monitoring Trip (see Chapter One). The education component of the trip included (1) training in photo matching and monitoring techniques, and (2) an introduction to Southern Paiute cultural resources in the Colorado River Corridor. Trip participants included the Outreach and Education Assistant, one tribal monitor, the SPC consulting botanist, a UofA research specialist, and three trainees. The Kaibab Band of Paiute Indians provided transportation for the trip.

Downriver Trip

Summary of Activities

The principal downriver trip took place from July 5- July 14 and occurred in conjunction with the Monitoring Trip (see Chapter One). The education component of the trip included (1) specialized training in monitoring skills and techniques, (2) direct information about Paiute culture provided by elders and experienced tribal members, (3) learning through participation in Paiute traditional practices and in monitoring activities, and (4) information about policy and management related to Glen Canyon Dam. As in past years, the tribal elders were an integral component of the education program, sharing information about past as well as present relations between Southern Paiutes and the Colorado River Corridor. The education program was fully integrated into the monitoring program, and the trip schedule and activities is provided

Table 2.2. Trip participants included three Southern Paiute elders, the SPC Coordinator and Project Assistant/monitor, two additional monitors, six youth and young adult participants, the consulting ethnobotanist, and two education/research consultants.

2.1 Downriver Trip Schedule and Education Component Activities (1 - 9)

Day	Site	Activities Completed
5	South Canyon	Assist Monitors- Rock Art and Beach Policy Presentation - SPC Goals and Objectives
5	Nankoweap	Elder Presentation- Ethnobotany Monitor Training: Water Quality Assist Monitors- Archaeology and Plants
7	Little Colorado River	Paiute Cultural Transmission Policy Presentation - Both the Little and Colorado River Life Safety Presentation- Boatmen
7	Tanner Canyon	Assist Monitors - Rock Art Site Presentation on Petroglyphs
9	Deer Creek	Assist Monitors- Rock Art, Plants, Visitors, and Archaeology
9	Kanab Creek	Assist Monitors- Plants Transect #1, Beach Photo Monitoring Science Education Activity
10	Vulcan's Anvil	Transect Line Paiute Cultural Transmission and Visit
11	Whitmore Wash	Assist Monitors- Archaeology, Rock Art, and Plants Transect Lines #1-#6 Elder Presentation- Arrow-making
12	Pre-Parashant Wash	Assist Monitors-Rock Art and Plants Paiute Visit and Cultural transmission
12	Ompi Cave	Paiute Cultural Transmission
13	Spring Canyon	Assist Monitors- Rock Art and Plants Science Education Activity
13	Indian Canyon	Assist Monitors- Archaeology and Rock Art Photo Matching
13	Pumpkin Spring	Paiute Cultural Transmission Assist Monitors- Beach Science Education Activity
13	Granite Park	Paiute Cultural Transmission
14	Take out	

The downriver trip was a success. The critical elements of this successful program are: (1) the participation of tribal elders who accompany participants to culturally significant sites and share traditional knowledge with them; (2) active participation of tribal monitors who work closely with participants to complete monitoring activities and share information about the cultural significance of the sites; (3) a monitoring training program specifically tailored to the needs of Southern Paiute monitors in training (see **Meetings and River Trip Preparation**); and (4) active participation of an educational specialist with experience in environmental/outdoor education and knowledge of environmental policy and the cultural, social,

political history of the area. Each of these elements enhances the entire program so program participants receive a comprehensive education about the region impacted by Glen Canyon Dam.

To enrich the educational component of the program and better integrate traditional and scientific knowledge and practices, several new activities were added to the science education component (see Stoffle, Austin, Fulfrost, Phillips, and Drye 1995). For example, at several sites, with side streams and the Colorado River, youth tested temperature and water quality to observe the relationships between temperature and dissolved oxygen, mineral content and source of the water, etc. On the last day of the trip, the youth graphed the data to illustrate the relationships.

Using the model developed in 1996, participants gathered each evening in a circle to share thoughts and feelings about the day's experiences and prepare for the following day's work. Information shared during these group meetings included stories about the places and the culturally appropriate behavior expected there. All participants discussed what they knew about the places and shared their feelings about visiting them. The Consortium Coordinator and educational consultant provided additional information about other groups and historical/political facts related to the places, as requested. The evening ended with a time for prayer and reflection.

Throughout the trip, participants recorded stops and activities in their river guides and notebooks. Prior to entering any site, the trip leaders would gather the participants together and prepare for any ceremonies or ritual practices appropriate to the situation. In general, at each site some participants would assist the monitors as they completed monitoring tasks and recorded condition of the site. Other individuals would remain with the elders to listen to stories and information the elders wanted to share, spend time in quiet reflection, or discuss policy issues. At large and complex sites, the monitors and participants would divide into two or more teams to gather all the necessary information in a timely manner. All participants gathered together again at the end of the monitoring tasks. Trip participants demonstrated their mastery of the skills needed for monitoring by taking greater responsibility for the monitoring tasks as the trip progressed.

Recommendations

The recommendations developed in 1996 and 1997 for the youth and general adult participants are equally valid for the tribal leader program. These include:

Trip participants must be carefully selected and include two elders, two monitors, an individual responsible for the trip's itinerary and logistics, and additional participants who are aware of the difficulties of working in the Colorado River Corridor and have been prepared for the experience through participation in pre-trip study and events. Individuals who join the trip at the last minute due to cancellations are inadequately prepared and more likely to lose interest in the activities taking place.

Program participants must have sufficient opportunities to learn skills needed for the trip and to practice those skills. The skills should be introduced, practiced, and mastered prior to the river trip so critical time on the trip is not spent in basic instruction in monitoring techniques.

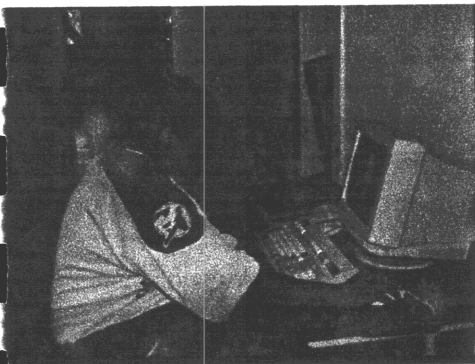
ence on the river, each individual should have assigned tasks that involve the participant in achieving the goals and objectives of the trip. Even with adult participants, the trip requires careful coordination to ensure that the necessary tasks are accomplished and all participants perceive themselves to be important contributors to the effort. Participants who desire time for independent work and reflection can inform the trip leader when they wish to be excused from their assigned tasks.

All trip participants must be kept informed of the daily schedule and tasks. Each participant was provided with a trip schedule and two river guides for recording the day's events and looking ahead to the next day's activities. The addition of the Paiute river guide was of tremendous help in orienting trip participants. This practice should be repeated in the future. Still, due to the uncertainty of camp sites and the changing conditions of the river environment, the schedule changed frequently. In addition to the evening circle during which information is shared and emotions are expressed, at least one individual should be prepared to present information about sites along the river during boat travel. As soon as individuals leave the boat, a group leader should describe the activities to take place at the site, expectations about who is responsible for what tasks, and an estimated time of stay.

Multimedia and GIS Learning Project

Summary of Activities

The Southern Paiute Consortium continued to take responsibility for much of the development and updating of the multimedia database and archive. The SPC office on the Kaibab reservation is the location at which most of the scanning and archiving of multimedia materials take place. The UofA continues to be integral to the overall multimedia and GIS program.



Small changes were made to the ArcView Geographic Information System (GIS) component of the multimedia database and archive. These changes were made primarily to make the Graphical User Interface (GUI) more intuitive for users of the GIS application. This included adding Help hints to custom buttons and tools, as well as slight modifications to the Avenue scripts behind the application. In addition, PowerPoint slideshows for all 1996, 1997, and 1998 monitoring sites were integrated into the GIS database and linked to their corresponding geographic entities within the ArcView interface. Most of this work was performed by the UofA team's GIS developer through the fall of 1998, and was installed on the Cultural Resource Office computer in January of 1999.

A review of the ArcView application thus far has yielded several recommendations for further enhancements. These include a greater capacity for customizing map layouts, as well as incorporation of more detailed descriptions of particular geographic features in the monitoring process.

2.2 SPC Schedule for University of Arizona July 18-23, 1998

Aug	Arrive Tucson, check into rooms, dinner and orientation	
	Morning Activities	Where
Aug	Data entry	Ger. 334
	Draft of Final Report	Ger. 350C
	Learn scanning and scan monitoring photos	Ger. 350C
	Afternoon Activities	
	Scan monitoring photos	Ger. 350C
	Draft of Final Report	Ger. 350C
	Data entry	Ger. 334
	AGIC1999 Arizona Geographic Information Conference	Marriot Hotel
	Morning Activities	Where
Aug	GIS Presentation	Ger. 350C
	Plant Transect Graphs	Ger. 334
	Richard Stoffle: Cultural Resource Policy	Anthro. Bldg.
	Labeling Site Photos	Ger. 334
	Afternoon Activities	
	Scan monitoring photos	Ger. 350C
	Report writing	Ger. 350C
	Archaeology and Plant Data Entry	Ger. 334 & 350B
	Type new photo lists	Ger. 334
	Morning Activities	Where
Aug	Report writing	Ger. 350C
	Scan student photos for multimedia archive	Ger. 350C
	Plant Productivity Graphs	Ger. 334
	Update photo logs and photo archives	Ger. 334
	Meet with UofA Critical Languages Program Staff about Paiute language program	Critical Languages
	Afternoon Activities	
	Scan photos for final report	Ger. 350C
	Report writing	Ger. 350C
	Student stories for multimedia archive	Ger. 334
	Morning Activities	Where
Aug	Discuss recommendations for 2000	Ger. 334
	Scan student photos for multimedia archive	Ger. 350C
	Students finalize stories for multimedia archive	Ger. 350B & C
	Update photo logs and photo archives	Ger. 334
	Paths of Life Museum	Arizona State Museum
	Afternoon Activities	
	Scan photos for final report	Ger. 350C
	Report writing, review 2000 schedule	Ger. 350C
	Complete entries to multimedia archive	Ger. 334
	Morning Activities	Where
Aug	Return to Kaibab	back across the river

The multimedia and GIS aspect of the education and training program provides a critical link in experiencing a place, collecting information about it, and storing that information so it is accessible to decision makers. From August 8- 14, 1999, the Southern Paiute Consortium Coordinator and Project Assistant, five participants from the Kaibab, Shivwits, and Cedar Bands and the UofA for training and technical assistance with the multimedia database and archive (Table 2.3). Additional funding for this trip was provided by OMG Apex, Inc. The UofA provided project participants access to computers, training, and knowledgeable faculty and staff. Project participants worked with UofA faculty and staff to put data into the multimedia database archive and modify the plant reference guide. While at the UofA, the SPC monitors also worked with UofA ethnographers and consulting botanist to analyze the monitoring data and complete the 1999 annual report.

Project participants worked in pairs to enter monitoring data into the monitoring database. They scanned photos and added pages to the SPC multimedia archive. They also helped update a computerized catalog system for monitoring photos and scanned photos for incorporation into the multimedia database. Project participants reviewed the existing GIS components of the database and requested additional analyses necessary for preparing for the year 2000 monitoring program.

The work begun at the UofA was continued into September at the SPC office on the Kaibab Paiute Indian Reservation.

Recommendations

The multimedia database and archive, including a GIS component, provides a critical link between experiencing a place and connecting that place to other places and information. It also is an excellent format for storing information and making it accessible to decision makers. The integration of computer training, data entry, and use of the data in preparing for another river trip proved to be an effective and efficient use of limited time and resources.

The program relies heavily on resources of the UofA that are made available to the program at little or no cost to the SPC. The university also provides access to many computers at the same time to facilitate learning, data entry, and analysis. The success of the program was demonstrated again in 1999 in the ability of the SPC to take responsibility for an increased number of tasks, such as updating photo logs and scanning monitoring photos, that were initially performed at the UofA. Therefore, it is recommended that one component of the multimedia and learning project continue to take place at the UofA, with additional learning opportunities to be offered on the Shivwits and Kaibab Paiute Reservations.

Public Education and Outreach

The SPC submitted and were funded under an unsolicited proposal to the GCMRC to increase public education and outreach related to its Colorado River program. With the GCMRC funds, the Consortium printed copies of the Paiute River Guide for all trip participants, printed copies of the Paiute plant reference guide for tribal monitors, and began distribution of the Public Multimedia Module to tribal members.

The SPC provided a demonstration of the Public Multimedia Module to staff at the Pipe Springs National Monument and then provide copies of the Module to the Zion National History Association for sale in the Monument gift shop. The SPC also sold copies of the Module to the Cliffs Convenience Store at Pipe Spring, Arizona for sale to area visitors. The Module was in the Native Peoples of the Southwest course at the University of Arizona during the 1998-1999 school year. An instructor from Pima Community College in Tucson has requested copies of the module for incorporation in his course.

The SPC Coordinator, a tribal monitor, and the Kaibab Tribal administrator participated in the Grand Canyon River Guides training seminar in May 1999. These individuals provided information to the river guides about Southern Paiute traditional lands, their perspectives on the Grand Canyon and Colorado River Corridor, tribal expectations of visitors to the canyon, and concerns about the impacts of the dam and of visitors to places along the river. They also informed the guides of the development of the Programmatic Agreement and tribal participation in the Adaptive Management Program.

The SPC Coordinator also participated in the Adaptive Management Workgroup river trip from May 16-22. Throughout the trip, the Coordinator provided information to the other workgroup members about the Southern Paiute relationship to the Grand Canyon and concerns about the operations of Glen Canyon Dam.

Recommendations

A user feedback survey will be developed for the Public Multimedia Module to evaluate the module and provide specific suggestions for updating and revising the module, which will be completed in 2000 as the SPC distributes the remainder of the first run of the CDs.

There is still no capacity to carry the Public Multimedia Module to the World Wide Web because of technological limitations. The SPC will continue to monitor the development of multimedia technology and consider this option in the future. It is difficult to predict when the necessary technological advances will allow this product to be usable on the Web.

Language Program Development

Summary of Activities

Due to the loss of several key individuals in 1998 and 1999, there was little activity in the Southern Paiute Consortium language program. The SPC is working on a plan to create a CD-ROM based language program for tribal use.

Recommendations

Language and culture are intimately related, and programs that involve the preservation and use of cultural resources are incomplete without attention to the preservation and use of

the language. Therefore, efforts to continue to integrate Southern Paiute language learning and into the Colorado River Corridor monitoring and education program should continue.

and Written Reports

The final aspect of the education and training program is the presentation of findings, in and written form, to the tribal governments and members of the participating tribes. Tribal participants wrote reports and submitted them to their respective tribes. Prior to the trip to the UofA, they met together to share stories and select photos to be included in the multimedia database and archive. They submitted written stories of their experiences for that database. These stories and accompanying photos were incorporated into the database and archive during the July trip to the UofA.

Recommendations

This element of the program was important for bringing closure to the 1999 program and to inform tribal council members, tribal members, families and friends about the overall monitoring program. The ongoing success of the SPC monitoring and education program depends on the continued support of the program from throughout the involved tribes. Trip participants expressed a desire to have more people involved in the program. The Public Multimedia Module is the mechanism for sharing information about Southern Paiutes and the program. The pages of the multimedia database and archive that are specifically devoted to the experiences of trip participants provide a historical account of the SPC program.

Summary and Conclusions

The SPC Education and Training program continues to grow and change to meet the needs of the participating Southern Paiute tribes, the Bureau of Reclamation (BOR), and others who have an interest in Southern Paiute concerns in the *Colorado River Corridor*. Southern Paiute decision makers must remain informed about activities that impact the places and resources of concern to the Paiutes, such as the operations of Glen Canyon Dam. Therefore, it is appropriate and necessary that the education and training program expand to include present and future tribal members who are involved in decisions regarding the operation of the Dam.

Where applicable, the 1999 education and training program utilized the recommendations provided in previous years to adapt the program to better serve the needs of the involved tribes and the BOR. New sources of program support were identified, and these efforts will continue in the future. As in past years, the program proved to be an important component of the SPC monitoring program offered in conjunction with regularly scheduled monitoring activities whenever possible. Therefore, the program continues to provide considerable benefit while requiring few extra resources.

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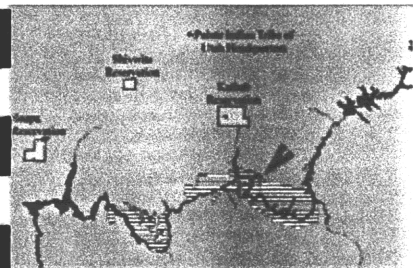
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Paiute Plant of the Day

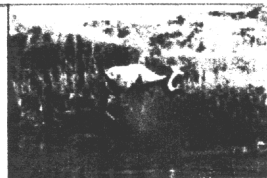


- *Sua*
- *Pinus edulis* var. *strobilifera*
- *Sua* bark

SUUV is very useful to the Paiute people. The berries and seeds are eaten fresh, or mashed into a beverage. The stems are used for making baskets, cradles, water jugs, thimbles, and general containers. SUUV is considered superior to willow for basketry, and is therefore preferred.

Five big horn sheep were seen grazing along this portion of the Canyon by the 1996 Paiute monitoring team. A large ram was also spotted by the 1998 team. Traditionally, Southern Paiutes came into the canyon to see the sheep during the migratory season, and hunted them for food. In the mountain sheep dance, a ceremony that takes place prior to the hunt, the big horn sheep has its own song.

Stone Creek



Stone Creek is an open side canyon in a broad, sunny valley with a permanently flowing stream. A trail leads from the beach to the top of a waterfall, then follows the creek for several miles. It is believed that the trail along the stream at Stone Creek afforded rim-to-river access in this part of the Canyon.

130 ♦

Bedrock Canyon

♦ 125

Yetta Jake, a Southern Paiute elder, discusses and demonstrates the many uses of SUUV to members of the 1998 monitoring team at Stone Creek.

120 ♦

